DOCUMENT RESUME

ED 477 082 IR 021 810

AUTHOR	Pearson, E. J.; Koppi, Tony
TITLE	Essential Elements in the Design and Development of Inclusive Online Courses.
PUB DATE	2002-06-00
NOTE	7p.; In: ED-MEDIA 2002 World Conference on Educational Multimedia, Hypermedia & Telecommunications. Proceedings (14th, Denver, Colorado, June 24-29, 2002); see IR 021 687.
AVAILABLE FROM	Association for the Advancement of Computing in Education (AACE), P.O. Box 3728, Norfolk, VA 23514. Tel: 757-623-7588; e-mail: info@aace.org; Web site: http://www.aace.org/DL/.
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Access to Education; Assistive Technology; *Disabilities; *Distance Education; Educational Equipment; Foreign Countries; Higher Education; *Instructional Design; *Instructional Development; *Online Systems; *Special Needs Students
IDENTIFIERS	Class Inclusion; University of New South Wales (Australia)

ABSTRACT

This paper discusses issues that are central to accessible online education. A recent research project investigated the accessibility of online courses for students with disabilities by evaluating existing courses, developed by academics at the University of New South Wales (UNSW). The evaluation revealed evidence that some aspects of the courses were inaccessible, but that with careful design guidance and awareness of the needs of students with disabilities, those courses could be made more accessible. As a result a set of Guidelines for Accessible Online Courses was produced (Pearson & Koppi 2001) specifically to aid academic developers of online courses with limited technical ability. However, these guidelines assume that the academic developer understands and accepts the issues related to inclusive design and development. Therefore the authors used their experience and the knowledge gained through researching the guidelines to identify the specific issues that one needs to consider, and the required skills to understand inclusion and accessible design. The issues were encapsulated into five major themes: legal or quality assurance requirements;awareness of and the ability to use the available guidelines and protocols; some understanding of the assistive technologies used by students with disabilities; awareness of designing for inclusion; and understand and apply the checking tools and mechanisms that are available. These themes were incorporated into a series of face-to-face workshops and an online course offered in flexible mode, aimed at assisting the academic in understanding both the broader issues of accessibility, and in developing the skills and knowledge for accessible course design. (Contains 11 references.) (Author)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 477 082

Essential Elements in the Design and Development of Inclusive Online Courses

Dr E J Pearson
Special Needs Computing Research Unit
University of Teesside
United Kingdom
e.pearson@tees.ac.uk

Associate Professor Tony Koppi
Educational Development and Technology Centre
University of New South Wales
Australia
t.koppi@unsw.edu.au

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

G.H. Marks

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Abstract

This paper discusses the issues that we consider central to accessible online education. A recent research project investigated the accessibility of online courses for students with disabilities by evaluating existing courses, developed by academics at the University of New South Wales (UNSW). The evaluation revealed evidence that some aspects of the courses were inaccessible, but that with careful design guidance and awareness of the needs of students with disabilities, those courses could be made more accessible. As a result a set of Guidelines for Accessible Online Courses was produced (Pearson & Koppi 2001) specifically to aid academic developers of online courses with limited technical ability.

However, these guidelines assume that the academic developer understands and accepts the issues related to inclusive design and development. We decided therefore to take a step back and use our experience and the knowledge gained through researching the guidelines to identify the specific issues that one needs to consider, and the required skills to understand inclusion and accessible design. The issues were encapsulated into five major themes: legal or quality assurance requirements; awareness of and the ability to use the available guidelines and protocols; some understanding of the assistive technologies used by students with disabilities; awareness of designing for inclusion; and understand and apply the checking tools and mechanisms that are available

These themes have been incorporated into a series of face-to-face workshops and an online course offered in flexible mode, aimed at assisting the academic in understanding both the broader issues of accessibility, and in developing the skills and knowledge for accessible course design.

IR021810

BEST COPY AVAILABLE

Background

Our own research (Pearson, 2001) and others (Grimaldi and Goette, 1999) have noted the liberating effect for students with disabilities being able to access learning materials and resources on the web. However, the same research concludes that students may have particular needs which need to be addressed in the design of online course and learning materials and which can in fact present further barriers to inclusion. Some examples include:

- students with vision impairments may use screen magnifiers or screen readers
- those with hearing impairment may need captioning or commentary for video and other multimedia
- students with learning disabilities such as dyslexia might use speech recognition software for data input
- people with other disabilities including aphasia or colour blindness need clear access to structure, careful use of colour, and consistent organization of learning materials
- students with physical disabilities may use alternative input mechanisms and need easy navigation

All of these requirements have an impact on the way the student interacts with a learning environment. Furthermore, some students might not be fluent in the language of study or there could be other technical barriers e.g., a slow modem or they might be using a text-only browser – all of these things can present further barriers to access. While many of the adjustments, which make sites accessible for use with screen readers, also provide effective access for others with disabilities; that is not always enough. Careful design – particularly in the context of online learning – can mean more effective access for all students and provide a better experience for all.

Partners

This work is a collaborative project between University of New South Wales (UNSW), and University of Teesside (UoT). UoT provide the research expertise in special needs and accessibility, while UNSW contribute the technical expertise and resources. The courses have been developed for staff development purposes at UNSW and for a Masters level module for Multimedia students at UoT.

Introduction

As a result of a research project (supported by the Leverhulme Trust, UK) which set out to investigate the accessibility of online courses (in this case courses developed in WebCT), we produced a set of guidelines for accessible online courses (Pearson & Koppi, 2001). The guidelines were based on those produced by the Web Accessibility Initiative (http://www.w3.org/WAI/) but have been designed specifically to aid academic developers of online courses with limited technical ability. The guidelines constitute a handbook and guide for academic developers for the design and implementation of online courses. They provide advice, practical examples, references and links for the designer. The guidelines are available to staff at UNSW, but also to anyone requesting them both in print and online (in an accessible format).

Following on from this research and the resultant guidelines, we set out to explore the extent to which the guidelines can be used as a basis for staff development and to encourage prospective online course designers to develop courses which are accessible and inclusive for all students. We used the Guidelines first as a basis for the development of a face-to-face workshop concerned with accessibility. The workshop was used not only to train Teaching Fellows in accessible design, but also as a pilot for the creation of an online course in accessible design. Our experience of the face-to-face workshop provided us with the opportunity to reflect on the process, the content and the tasks and consider how they could be translated to a flexible mode(Koppi and Pearson, 2002).

Five major themes were identified which we considered desirable for the academic to understand, appreciate or develop skills in for accessible design. These five themes encompass:

- legal or quality assurance requirements;
- awareness of and the ability to use the available guidelines and protocols;
- some understanding of the assistive technologies used by students with disabilities;
- awareness of designing for inclusion; and
- understand and apply the checking tools and mechanisms that are available.

The workshops and online course were developed to cover these five areas. The remainder of this paper discusses each of these areas and how they relate to the development of accessible online courses and the designer's role in meeting the requirements of students with disabilities.

Legal and Quality Assurance Considerations

The rights and needs of students with disabilities are now recognised in the Special Educational Needs and Disability Act 2001 and through changes to the Disability Discrimination Act 1995 in the UK, the Disability Standards for Education under the Disability Discrimination Act 1992 in Australia, and the section 508 of the Americans with Disabilities Act in the USA. Those developing courseware need at least to be aware of the acts and take this into consideration in the provision of online resources.

However, it is perhaps more relevant for academics to consider accessibility in terms of quality assurance and the Quality Assurance Agency's (QAA) (in the UK) expectations of Higher Education Institutions in complying with legal obligations. The QAA set out 24 precepts or standards that institutions are expected to meet, including treating students with disabilities as part of the academic community. Possible action includes:

- accessible Web and Intranet sites, and alternative formats for programme details and other information;
- adaptation of course material (including electronic material) and course delivery to ensure access; and

- training staff to use relevant technology and to produce accessible electronic courseware, (JISC, 2001).

Guidelines and Protocols

Web designers and course developers need to be aware of and be able to use the guidelines to ensure that their web sites and courses are compliant with the W3C thereby meeting basic accessibility requirements.

The W3C guidelines for accessible web design are, at present, quite technical in nature and lack examples. Although the WAI are working on developing a more user friendly set of guidelines, the Pearson and Koppi (2001) Guidelines for Accessible Online Courses, are designed to assist the average non-technical academic designer who is developing online learning materials and resources. They consist of a set of tips, techniques, examples, references and links to other sources of information to help the developer to produce accessible courses. There are also other guidelines, most of which are based on those developed by the WAI at W3C, relating to the design of web sites in general.

Assistive Technologies

Assistive or enabling technologies are devices, hardware or software, which enable people with disabilities to use the computer. Examples of assistive technology include screen readers (such as JAWS), screen magnifiers, alternative keyboards or input devices, voice recognition software and text-only browsers. Some experience in the use of these devices is beneficial for the courseware developer. It helps to understand the way that students interact with the online environment and the overheads that the use of such technology can involve, including difficulty in navigation and the extra time that may be required. Experience in interacting with the learning environment using assistive technologies can also highlight their limitations when used with certain features e.g., chat rooms. Some assistive technologies (e.g., screen magnifiers, high contrast screen settings) can also be used for simple accessibility checks.

Designing for Inclusion

Design is central to the whole issue of accessibility and in this context we are really referring to learner-centred design (Pearson & Green 1999), which means understanding and considering who the user is, what their needs are, what you want them to learn, how they are going to learn it, and how you are going to support them in achieving their learning objectives (McLoughlin and Marshall, 2000; and Winnips, 2001). In addition, we need to consider structural, navigational and interface design, and we also need to think about designing accessible resources and documents.

Accessible document design requires some forethought and skill to be accessible to those using assistive technologies. The academic designer needs to consider the structure and appropriateness of their documents as well as the format in which they are presented. PDF documents, for instance, can be a particular problem. With the correct tools and skills, however, many PDF and other documents can be made accessible.

Checking tools and mechanisms

Checking tools can be used for either checking documents for accessibility before they are published or to check an existing web site online. There is a number of tools, or mechanisms, available.

BOBBY (CAST 2001) can be used to check single pages online, or can be downloaded to check entire web sites on payment of a license fee. It provides checks on the accessibility of web pages in accordance with the W3C guidelines and the requirements of ADA section 508. The checks are, however, largely functional and many design elements require a manual check.

A-Prompt (Accessibility Prompt 2001) evaluates web pages for accessibility barriers and making repairs to correct those problems. A-Prompt is also based on the W3C guidelines and is made available free of charge through the University of Toronto and the University of Wisconsin.

Authoring tools such as Macromedia Dreamweaver include a number of plug-ins or extensions that enable accessibility checks of web pages as they are developed. These extensions include the ability to evaluate and fix some accessibility problems to meet the requirements of the W3C guidelines and the ADA 508 requirements.

There are tools available within Internet Explorer or as Windows utilities that might be used by people with disabilities and that are available to any PC user at no additional cost. So that, for instance, you can use the screen magnifier or switch off graphics to check what the site would look like to someone who either doesn't use graphics or can't see them.

Conclusion and Further Developments

Taking all of these themes into consideration, the legal and quality assurance obligations; the guidelines that are available for us to follow; awareness of and an ability to use some of the assistive technologies that people with disabilities use; particular attention to the design of learning environments; and being able to use the checking tools that are available, we have created a course which will give students of multimedia and staff developing online courses the opportunity to investigate and develop skills in each of these areas. At the end of the course the participants will be well equipped to both understand and undertake the development of accessible online courses. It is important that course designers both understand the need for accessible courses but also that they are equipped with the skills and resources necessary to be able to do that.

Further developments will include adapting the course to cater for the needs of the more technical web developer to encompass techniques in the development of accessible multimedia, such as video streaming; and understanding of the accessibility features, claims and limitations of software products such as Adobe and Macromedia.

The next stage of the process is to evaluate and compare the face-to-face workshops and the online course in practice to determine its effectiveness and requirements for enhancement.

References

A-Prompt, Adaptive Technology Resource Centre, http://aprompt.snow.utoronto.ca/, accessed 18/12/01

CAST (2001) http://www.cast.org/bobby, updated16 December 2001, accessed 17 December 2001

JISC (2001) "Disability Technology and Legislation: New Pressures and New Opportunities for Further and Higher Education Institutions and Staff", JISC Senior Management Briefing Paper, September.

Grimaldi C & Goette T, (1999), "The Internet and the Independence of Individuals with Disabilities", *Internet Research: Electronic Networking Applications and Policy*, Vol. 9 No 4, pp 272-80

Koppi, A.J. & Pearson E. J, (2002), "Design and development of a flexible online course for making accessible online courses", Paper submitted to ED-MEDIA, Denver, June

McLoughlin, C., & Marshall, L. (2000), "Scaffolding: A model for learner support in an online teaching environment", Paper presented at the Flexible Futures in Tertiary Teaching Forum, Proceedings of the 9th annual Teaching Learning Forum, 2-4 February 2000, Perth: Curtin University of Technology

Pearson E. J. (2001) "Strategies for Developing Inclusive Online Courses", WebCT Asia-Pacific Conference, Adelaide, Australia, April 10

Pearson E. J & Green S.J (1999) "Courseware –Engineering or Design?", proceedings, ALT-C conference, Bristol, UK, September.

Pearson, E and Koppi, T (2001), "Guidelines for Accessible Online Courses", Internal publication of University of New South Wales, http://www.edtec.unsw.edu.au

Web Accessibility Initiative (WAI) http://www.w3.org/WAI/

Winnips, K, (2001) "Scaffolding the development of skills in the design process of educational media through hyperlinked Units of Learning Material (ULMs)," University of Twente, Netherlands, (last accessed 9/11/01)

BEST COPY AVAILABLE

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

X	This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.
	This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").